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1950

TESTING FOR YIELD
BARLEY VARIETY PLOTS
TISDALE NURSERY
UNIVERSITY OF SASKATCHEWAN

Barley Varieties

FOR WESTERN CANADA

Prepared by
PROF. T. J. HARRISON
and
ASSOCIATE AUTHORS

PUBLISHED BY
BARLEY Improvement INSTITUTE
•RESEARCH •ECONOMICS
206 GRAIN EXCHANGE BLDG., WINNIPEG
Sponsored by the Brewing and Malting Industries of Canada

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TESTING FOR QUALITY,
Barley Improvement Institute.

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Foreword

THE BARLEY IMPROVEMENT INSTITUTE received its national charter in May, 1948. The object of the Institute is to assist in the improvement of the yield per acre and quality of barley in Canada. It is not the purpose of the Institute to usurp or encroach upon the activities of other organizations functioning in this field, but rather to assist them in the furtherance of their barley projects.

Since any basic improvement must be in the betterment of the existing varieties or the development of new varieties, the first effort of the Institute will be to assist the barley breeders at the Universities and in governmental organizations to attain these ends. The second effort will be toward encouraging and assisting in the use of the better varieties by the producers.

This brochure is prepared in the hope that it will assist the producers in evaluating the varieties now extant in Canada and thus help in the selection of the variety best adapted to the region and to the market available. The material has been prepared jointly by the barley specialists in the Universities, Experimental Stations and the Grain Research Laboratory.

T. J. HARRISON, Director
BARLEY IMPROVEMENT INSTITUTE.

Barley Varieties For Western Canada

THE fundamental purpose of barley research is to make barley production more profitable to the farmer and the quality more suitable to the industry. The factors which control yield and quality may be summarized and designated, "The Decalogue of Profitable Barley Production."

The Decalogue of Profitable Barley Production

I. Locate in an area adapted to barley growing.
II. Produce the quality of barley required by one of the barley industries.
III. Select the variety best suited to the industry and to the area where it is to be grown.
IV. Use pure, viable seed of the variety selected.
V. Treat the seed to control seed and soil borne diseases.
VI. Place the barley in the best location in the crop rotation.
VII. Prepare the land, and seed the crop according to the approved methods recommended for the region.
VIII. Spray the growing crop to control weeds and insects.
IX. Harvest and thresh the crop by methods that will maintain the quality.
X. Market the grain to secure the highest returns.

The Variety

The type and variety of barley used by the grower will largely determine the success or failure of his barley growing enterprise. In selecting a variety, the Western Canadian grower must give consideration to both yield per acre and quality.

The yield per acre is the controlling factor in cost of production. It costs almost as much to produce a 10 to 20 bushel per acre crop as it does to produce a 40 to 60 bushel per acre crop, and the returns may be double to treble the amount.

The yield depends upon the inherent yielding ability of the variety, disease and insect resistance, strength of straw, resistance to "necking" and shattering, its adaptability to the soil and climatic conditions, and cultural practices in use in the area.

When barley is grown as a cash crop, the importance of quality is quite apparent for it is reflected in the higher grades obtained and consequently higher prices. The quality is the result of the inherent quality of the variety, its resistance to certain diseases and insects, its adaptability to the area where grown, the stage of maturity when harvested, and threshing technique.

The barley scientists have assisted the grower in selecting the most suitable variety by establishing various lists of approved varieties: (a) varieties licensed to be sold as seed in Canada, (b) varieties adapted to the areas within the provinces; (c) varieties in demand by the different industries, and (d) varieties eligible in the different commercial grades.

Licensed Varieties

In order that seed barley can be advertised and sold in Canada, the variety must be licensed by the Dominion Department of Agriculture. Before a variety, either one originated in Canada or one developed in another country, can be licensed; it must have been tested at approved experimental stations within the region where it is to be distributed for a specified number of years (usually three years), and have proven to be superior to the standard variety or varieties in one or more properties.

Mr. P. R. Cowan, Cerealist, Central Experimental Farm, Ottawa, prepared a classified list of licensed varieties. The table is abstracted from the Proceedings of the Sixteenth Annual Meeting of the National Barley and Oil Seeds Committee.

List of Barley Varieties Authorized for Sale in Canada Under the Seeds Act, 1937

Varieties Produced in Canada by Hybridization	Varieties Produced by Selection from Old Sorts	Varieties Introduced into Canada from Foreign Countries
Grown Previous to 1923		
	Canadian Thorpe	Gartons
	Charlottetown 80	
	Duckbill	
	Hannchen	
	Himalayan	
	Manchurian	
	Mensury (1)	
	O.A.C. 21 (1)	
	Success	
Varieties Licensed between 1923 and 1934		
Regal.....1932*		Trebi.....1929
Nobarb.....1934		Velvet.....1929
		Burbanks Hulless..1929
		Glabron.....1931
		Colsess.....1932
		Wisconsin 38.....1933
		Peatland.....1933
Varieties Licensed since 1934		
Newal.....1935	Olli.....1936 (1)	Stephan.....1943
Rex.....1937	Pontiac.....1938	Compana.....1949
Plush.....1939		
Byng.....1939		
Prospect.....1940		
Sanalta.....1940		
Warrior.....1941		
Titan.....1943		
Galore.....1943		
Montcalm.....1945 (1)		
Barboff.....1945		
Vantage.....1947		

(*) The year indicates the year in which the variety was distributed.

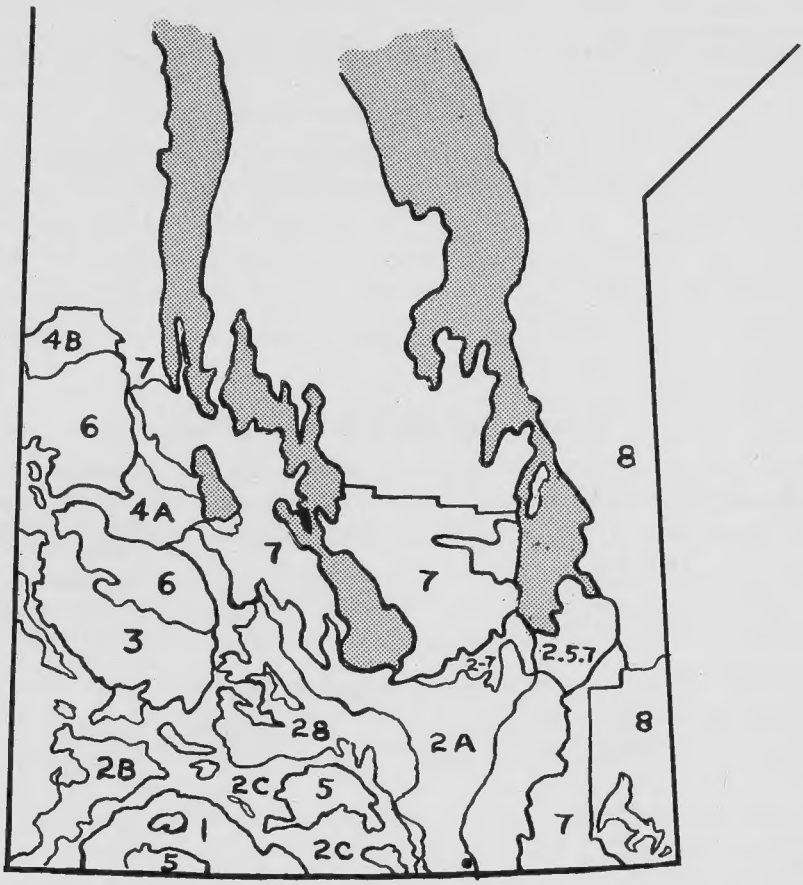
(1) Indicates malting varieties preferred by Canadian maltsters.

Variety Adaptation

In barley, probably more than in any other cereal crop, there is quite a distinct variety adaptation to quite well defined regions. Thus, a variety that gives good results in one zone may not be suited to another zone.

The agronomists and cerealists in each of the Prairie Provinces have established a list of varieties adapted to the various zones within their respective provinces. The maps outlining the zones and a list of the recommended varieties are published each year. The lists on the following pages were set up in 1949.

Manitoba. Manitoba is divided into seven major soil and climatic zones designated by the numbers 1 to 7. Zone No. 2 is further divided into 2A, 2B and 2C; and zone No. 4 into 4A and B4, making in all ten variety zones.



PROVINCE OF MANITOBA VARIETY ZONES

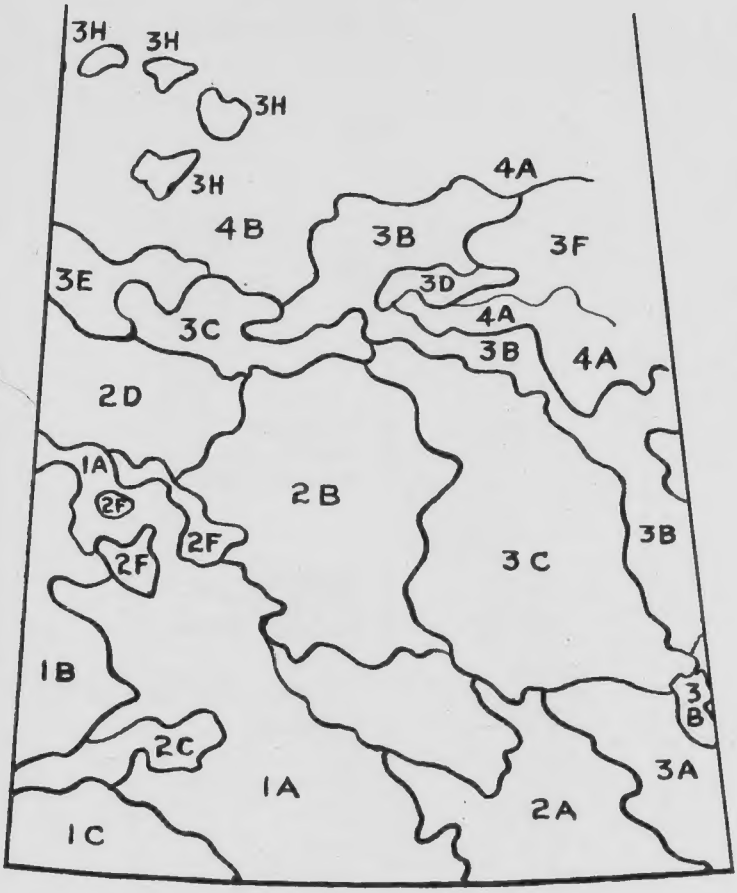
The recommended varieties are classified into Malting Barley and Feed Barley. Seven of the zones—2A, 3, 4A, 4B, 5, 6, and 7—are adapted to the production of malting barley. The other zones are adapted to the production of feed barley, but feed barley may also be grown in the malting barley zones; conversely, malting barley may under certain conditions, be produced in the feed barley zones.

Varieties Recommended for Manitoba

Zone	Malting Barley Varieties in Order of Preference	Feed Barley Varieties in Order of Preference
1.	None	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
2A.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Titan 3. Sanalta 4. Plush 5. Gartons
2B.	None	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
2C.	None	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
3.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
4A.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
4B.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
5.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
6.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Plush 3. Vantage 4. Sanalta 5. Gartons
7.	1. Montcalm 2. O.A.C. 21 3. Mensury Ott.60	1. Montcalm 2. Titan 3. Sanalta 4. Plush 5. Gartons

Saskatchewan. Saskatchewan is divided into four major soil and climatic zones designated by the numbers 1 to 4. These are further sub-divided into nineteen variety zones designated by the suffix of a letter as indicated on the map and in the list.

In Saskatchewan, barley varieties may be classified into malting, milling and feed varieties.



PROVINCE OF SASKATCHEWAN VARIETY ZONES

Varieties Recommended for Saskatchewan

Zone	Malting Varieties	Milling and Malting Varieties	Feed Varieties
1A	None	None	Titan
1B	None	None	Titan
1C	None	None	Titan
2A	None	None	Titan Vantage
2B	None	None	Titan Vantage
2C	None	None	Titan
2D	None	None	Plush
2E	None	None	Plush Titan
2F	None	None	Titan
3A	Montcalm	None	Montcalm Vantage
3B	Montcalm	None	Montcalm Plush Vantage
3C	Montcalm	None	Plush Vantage
3D	Montcalm	Hannchen	Hannchen Vantage
3E	Montcalm	None	Montcalm Plush
3F	Montcalm	Hannchen	Hannchen Montcalm Vantage
3G	None	None	Plush
3H	None	None	Montcalm
4A	Montcalm	None	Vantage
4B	None	None	Montcalm

In the above table, the varieties are in alphabetical order and are not in order of preference. The reason being that there is locality adaptation.

Alberta. Alberta is divided into four major zones designated from 1 to 4. The malting barley area includes part of zones 2 and 3, and all of zone 4.

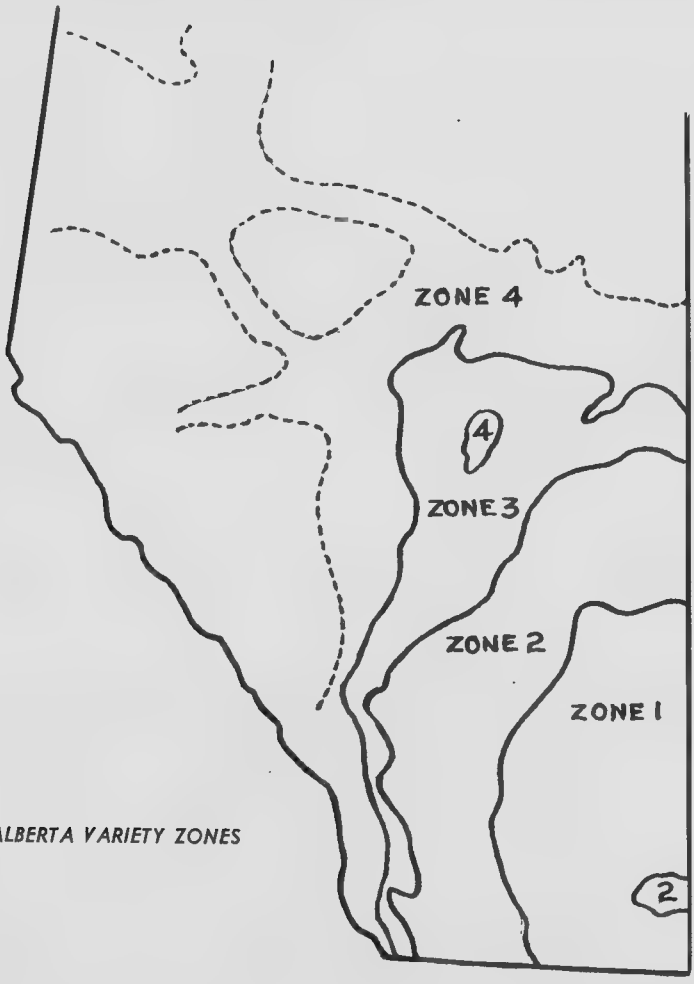
Varieties Recommended for Alberta

Zone	Malting Varieties	Feed Varieties
1. Dryland	None	Compana Titan
1. Irrigated	None	Newal Titan Trebi

Varieties Recommended for Alberta—(continued)

Zone	Malting Varieties	Feed Varieties
2. Dryland	Montcalm O.A.C. 21 Olli	Newal Olli Titan
2. Irrigated	None	Newal Titan Trebi
3	Montcalm O.A.C. 21 Olli	Newal Olli Titan
4	Montcalm O.A.C. 21 Olli	Newal Olli

The varieties are listed in alphabetical order and not according to merit or desirability. Thus, while Olli is at the bottom of the list, it is preferred as a malting barley, particularly in the northern and western sections of zones 3 and 4.



PROVINCE OF ALBERTA VARIETY ZONES

Industrial Requirements

In Western Canada, barley is grown for three distinct industries, i.e. malting, milling and feeding. The quality requirements of each industry are quite different. The result is that, throughout the years, there has been developed, by usage and science, three types of barley. These are designated usually according to the industry as malting barley, feed barley and, to a lesser extent, milling barley.

Malting Industry

The malting industry in Canada requires about 18,000,000* bushels of barley annually. This requirement is quite stable and fluctuates very little from year to year. The export sales of malting barley are quite another matter — they fluctuate widely from nothing to 40,000,000 bushels per year, depending upon the export demand, the supply, and governmental regulations.

The maltsters have the most exacting requirements of all the industries. This is due, in part, to the fact that malting is a biological process in which the barley must be germinated thus converting some of the starch to sugar and the increasing of the enzyme diastase, which will complete this change in later processing in the breweries and the malt extract plants. Malting barley, therefore, must have a high germination, contain a high percentage of starch, and produce sufficient diastase to convert the starch to sugar.

The grain must also have a quick, uniform germination. This reduces the malting time and insures that the starch in all the kernels is equally converted. The hull must be firmly attached to the kernel to prevent peeling and thus eliminating the growth of injurious fungi. It must also give a high yield of malt. In brief, the variety must be such that it will mature properly, not peel in threshing, have a quick, uniform, strong germination, and produce a high percentage of malt extract.

The Canadian maltsters, when possible, secure their supplies from the No. 1 C.W. Six-row and No. 2 C.W. Six-row commercial grades. If there is not sufficient of these grades available, they will take some No. 3 C.W. Six-row and even certain cars of the Feed Grades that are pure as to variety and can be cleaned up to their requirements. The top malting grades (Nos. 1 and 2 C.W. Six-row) usually sell at a considerable spread over the lower grades. In addition to this, the maltsters pay a malting premium of 5 cents per bushel on all barley selected by them. To get into this market, the producer should sow only pure varieties of O.A.C. 21, Montcalm, Mensury Ott.60, or Olli.

The exporters have a slightly different requirement. For example, the United States market favours a white or yellow aleurone barley which is designated "mellow," while the blue aleurone barley, as used in Canada, is designated "hard." In order to cater to this market, the No. 2 C.W. Yellow and No. 3 C.W. Yellow grades were established. However, it is interesting to note that the high extract blue barleys are now in more demand and the exporters are competing with the local maltsters for No. 1 C.W. Six-row, No. 2 C.W. Six-row and No. 3 C.W. Six-row. The varieties to grow for this export market may include, in addition to those enumerated for the Canadian trade, Regal, Prospect, Newal, and Wisconsin (38).

*The malting capacity of the industry is not 18,000,000 bushels but this amount is purchased to provide for "clean out and waste."

Grade Requirements

All commercial barley marketed through the country elevators in Western Canada is graded according to the standards set out in the Canada Grain Act, or established by the Grain Standards Committee of the Board of Grain Commissioners for Canada. These grades are designed first, to segregate the grain into groups or types of barley required by the malting, milling and feeding industries respectively; and second, to segregate the barley according to quality within the type.

Malting Grades

The domestic malting grades consist of No. 1 Canada Western Six-row, No. 2 Canada Western Six-row, and No. 3 Canada Western Six-row. These grades are defined in the Canada Grain Act and can be changed only by the parliament of Canada. In addition to these grades, and to provide for export purposes, the Grain Standards Committee of the Board of Grain Commissioners recommend the commercial grades No. 2 Canada Western Yellow and No. 3 Canada Western Yellow. The standards for these are fairly permanent, but may be changed by the Board as conditions warrant.

No. 1 Canada Western Six-row must be composed of at least 95 per cent O.A.C. 21, or any other six-rowed variety equal to it for malting purposes. Montcalm, Mensury, Olli and Manchurian are adjudged to be equal to O.A.C. 21. The grain must weight 50 lbs. per bushel and be sound and well matured; be practically free from weed seeds; and contain not more than ½ per cent wild oats, 1 per cent other grain, and not more than 1 per cent total impurities.

No. 2 Canada Western Six-row must be composed of at least 90 per cent O.A.C. 21, or any six-rowed variety equal to it for malting purposes. Montcalm, Mensury, Olli and Manchurian are adjudged to be equal to O.A.C. 21. The grain must weight 48 lbs. per bushel and be sound, reasonably well matured, but may contain some slightly weather-stained kernels. It must be practically free from weed seeds, and contain not more than ½ per cent wild oats or 1½ per cent other grain, and not more than 1½ per cent total impurities.

No. 3 Canada Western Six-row must be composed of at least 80 per cent six-rowed variety or varieties of at least fair malting quality. In addition to the varieties allowed in the two higher grades, this grade may contain Gartons, Peatland and Kindred. It must weight at least 46 lbs. per bushel and be practically sound, reasonably well matured, but may be weather-stained. It must contain not more than 1 per cent weed seeds, 1 per cent wild oats, 3 per cent other grain, and not more than 4 per cent total impurities.

No. 2 Canada Western Yellow must be composed of 90 per cent Wisconsin (38) Barbless or any smooth-awned, yellow or white variety equal to it for malting purposes. Newal, Prospect and Regal are adjudged to be equal to Wisconsin (38) Barbless. The grain must weigh at least 48 lbs. per bushel, be sound, reasonably well matured, but may be somewhat weather-stained. It must be practically free from weed seeds, and not contain more than ½ per cent wild oats, ½ per cent other grains, and not more than 1½ per cent total impurities.

No. 3 Canada Western Yellow must be composed of at least 85 per cent of any six-rowed, smooth-awned barley of fair malting quality. Newal, Prospect,

Regal and Wisconsin Barbless have been adjudged eligible for this grade. The grain must weigh at least 46 lbs. per bushel, be practically sound, reasonably well matured, but may contain weather-stained kernels. It must not contain more than 1 per cent weed seeds, 1 per cent wild oats, 3 per cent other grains, and not more than 4 per cent total impurities.

Milling Industry

A limited amount of barley, some 300,000 to 500,000 bushels, is used annually in Canada for milling purposes. The larger portion of this is used in the manufacture of pot and pearl barley. A quantity goes into the manufacture of barley flour used in the baking industry and in infant foods.

In this industry the hulls have to be removed, therefore a barley with a shallow crease is required; and because most of the hulls are removed by the attrition process, the kernels have to be uniform in size. Since the two-rowed varieties are more uniform than the six-rowed, they are used almost exclusively in this industry. The manufacturers of pot and pearl barley buy mostly the No. 1 and No. 2 C.W. Two-row grades. The varieties best suited for this trade are: Hannchen, Charlottetown No. 80, Canadian Thorpe, etc.

Both Sanalta and Rex are not favored because of the deep crease.

The price for the No. 2 C.W. Two-row is usually somewhat less than No. 2 C.W. Six-row. However, in areas where good two-rowed barley can be grown successfully, it is a profitable crop to the farmers providing there is not an over-production, as this market is quite limited.

The Canadian maltsters who are exporting malt are finding a demand for two-rowed barley malt. This trade may increase with a corresponding demand for this type of barley grown in the good malting barley regions or under irrigation.

There is little or no export market for this class of barley. In Europe the main barley crop is of this type, and barley that is not taken by the European maltsters can be used for milling purposes.

Milling Grades

The grades designated for segregation of milling barley are usually known as the Two-row Grades, although certain two-rowed varieties are not admitted to these grades.

No. 1 Canada Western Two-row must be composed of at least 95 per cent Canadian Thorpe, or any two-rowed variety equal to it for pearling or malting purposes. Hannchen and Charlottetown 80 are considered to be equal to Canadian Thorpe. The grain must weigh 51 lbs. per bushel and be sound and well matured. It must be practically free from weed seeds, contain not more than ½ per cent wild oats, 1 per cent other grains, and not more than 1 per cent total impurities.

No. 2 Canada Western Two-row must be composed of at least 90 per cent Canadian Thorpe, or a two-rowed variety equal to it for pearling or malting purposes. Canadian Thorpe, Hannchen and Charlottetown 80 are the only varieties eligible for

this grade. The grain must weigh 49 lbs. per pushel and be sound, reasonably well matured, but may contain some weather-stained kernels. It must be practically free from weed seeds and contain not more than ½ per cent wild oats, 1½ per cent oats, 1½ per cent other grains, and not more than 1½ per cent total impurities.

Feed Industry

Barley is the main feed crop in the hog industry in Canada and is used to a more limited extent as feed in the cattle and poultry industries. In the Prairie Provinces, feed barley is disposed of in two ways, i.e. fed on the farms where produced and sold as a cash crop for feeding in Eastern Canada and in British Columbia, or for exporting out of the country. On an average, about 120,000,000 bushels are used or sold for feed annually. This amount varies, depending upon the total annual production. About two-thirds of this is fed on the farms where it is produced and one-third is marketed.

While certain grades are designated as Feed (No. 1 Feed, No. 2 Feed and No. 3 Feed) all grades of barley can be used for feed. Practically any variety may be placed into the feed grades. These include Montcalm, O.A.C. 21, Olli, Mensury, Canadian Thorpe, Hannchen, Charlottetown 80, Plush, Vantage, Titan, etc., etc. The main factors in grading are impurities, and damaged and unsound kernels. The feeders' requirements are not exacting; therefore, the yield per acre seems to be the deciding factor. Smoothness of awns, thickness of hull and protein content are factors that should be given more consideration.

Feed Grades

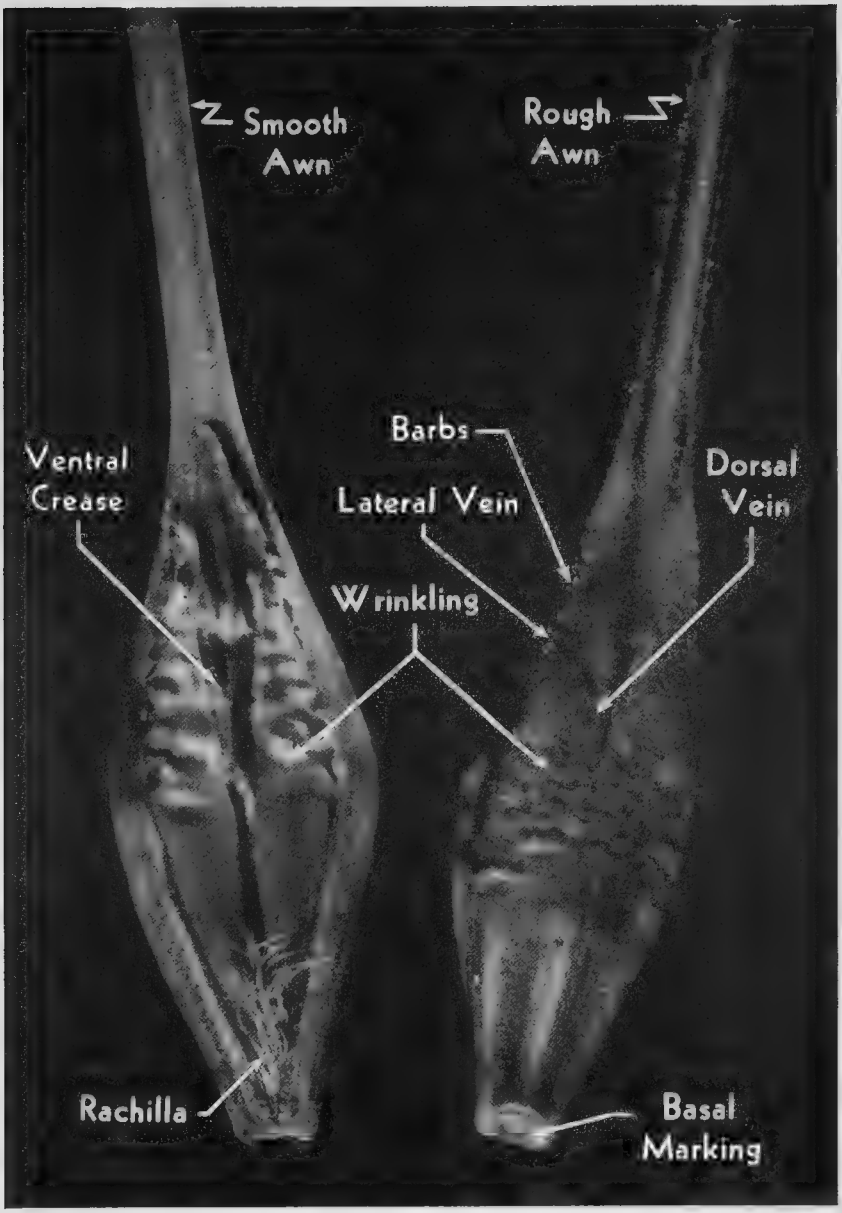
While all the foregoing grades can be used for feed, much barley that cannot be graded into the malting or milling grades can be used for feed. Therefore, the feed grades do not require to be as high in quality.

No. 1 Feed may be composed of any variety or type, or any combination of varieties or types. The grain must weigh at least 46 lbs. per bushel. It may be frosted, weather-stained, or otherwise damaged, but must be sweet. It cannot contain more than 2 per cent weed seeds, 4 per cent wild oats, 4 per cent other grain, and not more than 4 per cent total impurities.

No. 2 Feed may be composed of any variety or type, or combination of varieties or types. The grain must weigh at least 43 lbs. per bushel. It may be frosted, weather-stained, or otherwise damaged, but must be sweet, although it may contain 3 per cent heat damage. It cannot contain more than 3 per cent small weed seeds, 10 per cent wild oats, 10 per cent other grains, and not more than 10 per cent total impurities.

No. 3 Feed may be composed of any variety or type, or combination of varieties or types. It may consist of all barley excluded from the No. 1 Feed or No. 2 Feed Grades on account of weight or mixtures, but may not contain over 3 per cent heat damage. It cannot contain more than 3 per cent small weed seeds, 20 per cent wild oats, 20 per cent other grain, and must not contain more than 20 per cent total impurities.

CHARACTERS USED FOR IDENTIFICATION



—Courtesy of the Grain Inspection Branch, and Grain Research Laboratory, Board of Grain Commissioners for Canada.

Six-row, Awned Barley

SPIKE OR HEAD OF O.A.C. 21

Typical of most six-rowed, awned varieties grown in Western Canada.

Most varieties have nodding heads.

Some have more spreading awns than this head.

Two-row, Awned Barley

SPIKE OR HEAD OF HANNCHEN

This head is typical of the lax, nodding type, or, as it is sometimes referred to, the Chevalier type.

The compact, Duckbill or Thorpe, type is exemplified in the Canadian Thorpe variety.

HISTORY AND DESCRIPTION OF VARIETIES

It is important that the grower knows the variety he is growing. Frequently, the grower has purchased seed from a neighbor or has been using the same seed for many years. If he is to take advantage of the higher-priced, specialized market, he must have an approved variety and grow it at least commercially pure.

It is thought that while the descriptions are brief, they may, along with the photographs, give the grower a lead as to the variety he is growing and help him determine how pure it is. The history of the development and distribution of the variety will, it is hoped, help the grower in diagnosing the variety.

O.A.C. 21

History. The variety, O.A.C. 21, as the name indicates, was originated at the Ontario Agricultural College at Guelph, Ontario. In 1889, Dr. C. A. Zavitz, Professor of Field Husbandry, secured from Russia a sample of barley under the name "Mandscheuri." A very similar sort under the same name had been introduced into Wisconsin in 1861. This latter introduction was from Germany. It was introduced into Germany by a traveller who secured the seed in the Amur River district in Manchuria. The word Mandscheuri is German for Manchuria. Since the barley in these two varieties was very similar, it is quite possible they both came originally from the same source. This is also borne out by the spelling of the variety name.

Mandscheuri was released and grown quite generally in Ontario, where the variety name was contracted to Manshury and finally to Mensury.

In the spring of 1903, Dr. Zavitz planted 10,000 grains of Mandscheuri, separately equal distances apart. From these ten thousand plants, thirty-three were selected. The next year, these were planted separately in rows. The seed from this selection was then planted in the variety plots, where they were tested against other named varieties and hybrids. A few of these Mandscheuri selections out-yielded all other varieties in the test. Finally, one of these selections, with a comparatively stiff straw, was increased under the name O.A.C. 21. It stood up well in further tests and in 1910 was released to the farmers of Ontario through the medium of the Ontario Agricultural and Experimental Union.

Prior to the enactment of the McKinley tariff, which destroyed the Canadian export trade in malting barley to the United States, the Ontario farmers along the north shore of Lake Ontario were growing two-rowed barley. When this trade was lost, the farmers switched to the higher-yielding six-rowed varieties. Mandscheuri, or as it was known by that time, Mensury, was the most generally grown variety. With the advent of the higher-yielding, pure O.A.C. 21, the older varieties disappeared, until by 1927 about 98 per cent of the barley grown in Ontario was O.A.C. 21.

During the switch from two-rowed to six-rowed barleys, the malting quality deteriorated until the Canadian maltsters found it difficult to make good quality malt. There was little white aleurone barley grown. Finally, they started using some of the blue aleurone barleys and discovered that O.A.C. 21 made excellent malt. The credit for this discovery goes largely to C. D. McFarlane, the Manager of the Canada Malting Company malthouse in Montreal. Geo. E. Bailey and Peter Stewart of the same company at Winnipeg and Toronto respectively did much to encourage its growth by providing pure seed to the growers.

O.A.C. 21 was brought to Western Canada about 1912. One of the first men to increase the seed of it under the Canadian Seed Growers' Association rules was John Wiener, of Miami, Manitoba, and later Wm. Pierce, of the Birtle Demonstration Farm, took up this work. Much of the O.A.C. 21 now being grown in Western Canada came from seed selected and processed by these two growers.

O.A.C. 21 has had the widest distribution of any new variety in both Eastern and Western Canada. At one time, over 50 per cent of all the barley produced on the Prairies was of this variety.

Description. O.A.C. 21 is a six-rowed, rough-awned blue aleurone variety. It has a nodding head and, when ripe, has a tendency to "neck," i.e. break at the neck about three to six inches below the head. In dry, windy weather, considerable loss

O.A.C. 21

Six-row — Rough Awn

SPIKELET

Kernels —Three, laterals decidedly twisted.
Awns —Barbed, long.
Glume Awns—Barbed, long, purple tip.
Glumes —Half length of kernel, covered with long and short hairs.

KERNELS

Length —Midlong
Aleurone —Blue.
Basal Marking—Horseshoe depression.
Rachilla —Long, covered with short hairs.
Lateral Veins —Numerous barbs.
Lemma —Smooth to slightly wrinkled.
Palea —Slightly wrinkled.

takes place if the grain is allowed to become properly ripened. It is quite susceptible to stem rust and has a moderately stiff straw. It is quite resistant to both loose and other smuts.

Adaptation. O.A.C. 21, as indicated above, was grown very generally in Western Canada. The name has almost become a synonym for all rough-awned, Manchurian-type, six-rowed barleys. Therefore, in order to secure pure O.A.C. 21, the grower should purchase either registered or certified seed or grain that is the immediate progeny of such seed.

It is not grown under any other name in Canada, but in the United States it is sometimes called Arctic in Wisconsin, and Superior in South Dakota.

While O.A.C. 21 is still the standard of quality of malting barley in Canada, recently another variety, Montcalm, has been developed which has a higher percentage of extract and is also higher in yield per acre. O.A.C. 21, however, is recommended as second choice as a malting barley in zones 2A, 3, 4A, 4B, 5, 6 and 7 in Manitoba; and is one of the three best barleys in zones 2, 3 and 4 in Alberta.

O.A.C. 21 is the standard of quality for the top six-rowed grades. The definitions of No. 1 C.W. Six-row and No. 2 C.W. Six-row state they have to be composed of O.A.C. 21 or any other six-rowed variety equal in malting quality.

Montcalm

History. Montcalm is the result of very painstaking breeding and selection by the officials of the Agronomy Department of Macdonald College, Quebec. The late Professor Robert Summerby made a cross in 1916 between a black, smooth-awned

MONTCALM

Six-row — Smooth Awn

SPIKELET

Kernels —*Three, laterals quite twisted.*
Awns —*Smooth, long, persistent.*
Glume Awns—*Barbed, long, tips purple.*
Glumes —*Half length of kernel, long hairs confined to bands or covering the glumes.*

KERNELS

Length —*Midlong.*
Aleurone —*Blue.*
Basal Marking—*Horseshoe depression.*
Rachilla —*Long, covered with long hairs.*
Lateral Veins —*Several to numerous barbs.*
Lemma —*Yellow, nerves sometimes faintly purple, wrinkled.*
Palea —*Medium wrinkled.*

strain he secured from Professor F. Spragg of Michigan and a pure line strain he had selected out of a white, six-rowed, rough-awned barley grown quite generally by the farmers in Quebec. Professor E. A. Lods, a co-worker of Professor Summerby's, took over the progeny of this cross and finally selected B4917 and crossed this in 1922 with

a pure line strain of Mandscheuri that had been selected at Macdonald College. Professor Lods studied the progeny of this cross and made several selections. Finally, after several years, he named one selection, Montcalm, and distributed it in 1946. In that year, he made available about four bushels to each of the three Prairie Provinces. Richard Platte, at Nipawin, Saskatchewan, a member of the Canadian Seed Growers' Association, was given the responsibility of increasing Saskatchewan's share of this seed. He planted the seed in rows, three feet apart, and produced, the first year, some 600 bushels, of which 400 bushels were sold as certified seed. The next year, he produced several thousand bushels. In the other provinces, the seed was also increased; some by registered seed growers and some on institutional farms. In 1949, in Western Canada, about 24 per cent of the total barley acreage was seeded to this variety.

Description. Montcalm is a six-rowed, smooth-awned, blue aleurone variety. When grown from registered seed, it is remarkably uniform in growth and head type. It is quite similar to O.A.C. 21; in fact, it has been described as a smooth-awned O.A.C. 21, although its breeding is quite different. The straw is moderately strong and it is not as subject to "necking" as O.A.C. 21. It is somewhat more difficult to thresh, in that it peels more easily and portions of the rachis adhere to the kernel, causing a larger loss in cleaning before malting. It is not rust resistant and is more susceptible to smut than O.A.C. 21. Under normal conditions, it yields about 2 to 5 bushels more per acre and gives 1 to 2 per cent higher extract than O.A.C. 21.

Adaptation. Montcalm is recommended to be grown as a malting barley in zones 2A, 3, 4A, 4B, 5, 6 and 7 in Manitoba; zones 3A, 3B, 3C, 3D, 4A and 4B in Saskatchewan; and zones 2, 3 and 4 in Alberta. In addition, it is recommended as a feed barley in all zones in Manitoba, and zones 3A, 3B, 3C, 3D, 3E, 3F, 3H, 4A and 4B in Saskatchewan.

Montcalm is one of the approved malting varieties and is graded into No. 1 C.W. Six-row and No. 2 C.W. Six-row. Of course, if the quality of the sample is not equal to these grades, it may be placed in the No. 3 C.W. Six-row or even into the Feed grades.

Olli

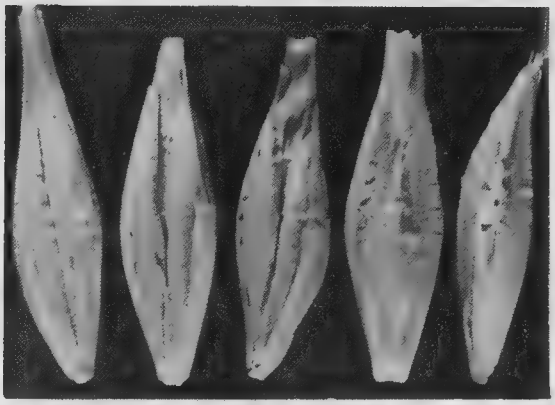
History. Olli is the progeny of a plant selection made at the Central Experimental Farm at Ottawa, Canada. Under the direction of Dr. L. H. Newman, Dominion Cerealist, a sample of a hybrid variety developed at the Experimental Station at Joksonin, Finland, was introduced into Canada and grown at the Central Experimental Farm at Ottawa. P. R. Cowan, Cerealist and Barley Breeder at Ottawa, made a selection from this introduction, which he distributed under the name of Olli. It was sent to the Branch Experimental Stations at Lacombe and Beaverlodge in Alberta. W. D. Albright, Superintendent of the station at Beaverlodge, was quite impressed with it, largely because of its yield and earliness. He was largely instrumental in its first distribution in the Peace River area. Geo. E. DeLong, at the Lacombe Experimental Station, became interested in its distribution in the malting barley area around Red Deer, Alberta. Geo. Valentine, of the Canada Malting Company, Limited, at Calgary, Alberta, found it to be an excellent malting barley and did much to popularize it in this region.

Description. Olli is a six-rowed, rough-awned variety with an early erect growth. It has a moderately stiff straw, and is tolerably resistant to smut. It is about two weeks earlier than O.A.C. 21.

Many of the commercial lots contain both blue and white aleurone. In preparing foundation seed for the seed growers, the plant breeders at Beaverlodge and Lacombe have selected for blue aleurone, with the result that it is now designated a blue aleurone variety. In the high altitude, short season area, between Edmonton and Calgary, it produces a large, plump kernel with a very high extract. In other

OLLI

Six-row — Rough Awn



SPIKELET

Kernels	*—Three, laterals twisted.*
Awns	*—Barbed, long, tips purple, deciduous.*
Glume Awns	*—Twice length of glume, barbed, tips purple.*
Glumes	*—Half to three quarters length of kernel, covered with short hairs.*

KERNELS

Length	*—Midlong.*
Aleurone	*—Mixed blue and yellow, pure strains are blue.*
Basal Marking	*—Transverse crease.*
Rachilla	*—Long, covered with short hairs.*
Lateral Veins	*Very few barbs.*
Lemma	*—Yellow, wrinkled, curved sharply backwards at tip. Purple coloring in dorsal vein.*
Palea	*—Slightly wrinkled, ventral crease open at awn end.*

regions, particularly in Saskatchewan and Manitoba, it produces a short "shoe peg" type of kernel which is not wanted by the malting industry. When grown in Alberta, it is considered to be equal to O.A.C. 21 in malting quality, although it differs in some malting characteristics.

Adaptation. Olli is recommended as the malting variety in zones 2, 3 and 4 in Alberta; in these zones it can also be used for feed purposes. It is not recommended in either Saskatchewan or Manitoba for either malting or feeding.

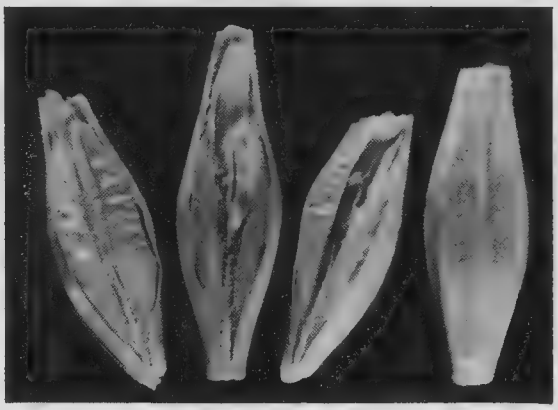
Olli, when it is grown in the proper regions, grades as top malting barley. It is, therefore, one of the approved varieties in No. 1 C.W. Six-row and No. 2 C.W. Six-row.

Mensury Ottawa 60

Mensury was one of the first six-rowed varieties to be grown extensively in Canada. It is believed that it is the direct progeny of the Mandscheuri that was introduced into Canada from Russia by Dr. C. A. Zavitz of the Ontario Agricultural College in the latter part of the nineteenth century. In fact, it is thought that the word Mensury comes from the farmers' contraction of the German word Mandscheuri. According to available information, the original Mandscheuri, like Mensury, was composed of a mixture of types; for example, in both of these so-called varieties, there was about 50 per cent of the kernels blue and 50 per cent white. From this mixture, Dr. C. A. Zavitz selected the blue aleurone O.A.C. 21. His contemporary, Dr. C. E. Saunders, Cerealist at the Central Experimental Farm, Ottawa, selected from much the same

MENSURY OTT. 60

Six-row — Rough Awn



SPIKELET

Kernels —*Three, laterals decidedly twisted.*

Awns —*Barbed, long, rarely deciduous, tips purple.*

Glume Awns—*Barbed, two to three times length of glume, tips purple.*

Glumes —*Half the length of the kernel, awned with short or long hairs.*

KERNEL

Length —*Midlong to long.*

Aleurone —*Blue.*

Basal Marking—*Horseshoe depression.*

Rachilla —*Long, covered with short hairs.*

Lateral Veins —*Numerous barbs.*

Lemma —*Yellow, smooth to slightly wrinkled.*

Palea —*Rather coarse, slightly wrinkled.*

material, another blue aleurone variety very similar in appearance to O.A.C. 21. Dr. Saunders' successors, Dr. L. H. Newman and his co-worker, Mr. P. R. Cowan, further selected this strain and distributed it under the name of Chinese or Chinese Ottawa 60. When it came to be produced under the rules of the Canadian Seed Growers' Association, it was decided to rename it and include the old variety name; hence it became known as Mensury Ottawa 60.

A fairly wide distribution of this variety was made in 1922 in both Eastern and Western Canada. It became quite popular in some sections of Manitoba largely on account of it having a somewhat stiffer neck than O.A.C. 21.

Description. Mensury Ottawa 60 is a six-rowed, rough-awned, blue aleurone variety. It is similar to O.A.C. 21 in both plant and kernel characteristics. About the only difference is its alleged stiffer neck. These two varieties are so nearly identical that it is believed that much of this variety is now grown under the name of the more widely known variety, O.A.C. 21.

Adaptation. Mensury Ott.60 is recommended as a malting variety along with O.A.C. 21 in zones 2A, 3, 4A, 4B, 5, 6 and 7 in Manitoba. It is not recommended in either Saskatchewan or Alberta.

Mensury Ott.60 and its prototype, Mensury, are both admitted to the malting grades No. 1 C.W. Six-row and No. 2 C.W. Six-row.

Manchurian

History. The Manchurian variety was a selection made from Mandscheuri by Dr. Chas. A. Saunders at the Central Experimental Farm, Ottawa, around the beginning of the twentieth century. It was similar to O.A.C. 21 excepting it had a white aleurone. Previous to the use of O.A.C. 21 by the maltsters, white aleurone barley was preferred

MANCHURIAN

Six-row — Rough Awn

SPIKELET

Kernels —*Three, laterals moderately twisted.*

Awns —*Barbed, long, rarely deciduous, tips have a tendency to be purple.*

Glume Awns—*Barbed, two to three times length of glume, tips purple.*

Glumes —*Half length of kernel, covered with short or long hair.*

KERNEL

Length —*Midlong to long.*

Aleurone —*Yellow.*

Basal Marking—*Horseshoe depression.*

Rachilla —*Long, covered with short hairs.*

Lateral Veins —*Numerous barbs.*

Lemma —*Yellow, slightly wrinkled.*

Palea —*Wrinkled.*

by the malting and brewing industries. Dr. Saunders thought Manchurian, with its white kernel, would therefore be more acceptable to these industries. They, however, preferred the O.A.C. 21, so Manchurian never became a popular variety in Canada.

Description. Manchurian was very similar in plant characteristics to O.A.C. 21. About the only difference was the color of the aleurone. Manchurian is white; O.A.C. 21, blue.

Adaptation. Early in the twentieth century a small distribution of the variety was made in Manitoba. It has long since disappeared or is so badly mixed with other sorts that it is difficult to identify. It is only included in this booklet because it is listed by the Grain Inspection Branch as one of the malting varieties that can be graded into No. 1 C.W. Six-row and No. 2 C.W. Six-row.

Gartons

History. The history of the origin of Gartons variety is quite obscure. It is known that the John Garton Company, Ltd., seedsmen in England, did select and distribute several rough-awned, six-rowed varieties. In the early twenties of this century, some of these were distributed in Western Canada; one of them, Gartons No. 68, was grown quite extensively in Manitoba. However, with the increase in O.A.C. 21 it seems to have completely disappeared. In the early part of 1930, a farmer near Portage la Prairie, Manitoba, secured a small sample of barley from a friend in England. All he knew about it was that his friend had secured the barley from the John Garton Company, Ltd.; he, therefore, called the variety Gartons. He increased the seed and sold it to his neighbors under that name. It did not appear to be a pure strain; some of

GARTONS

Six-row — Rough Awn

SPIKELET

Kernels —*Three, laterals slightly twisted.*

Awns —*Barbed, long, tips sometimes faintly purple, sometimes deciduous.*

Glume Awns—*Barbed, twice the length of the glume, tips yellow or faintly purple.*

Glumes —*Half the length of the kernel, covered with short hairs and occasionally long hairs.*

KERNELS

Length —*Midlong, centre kernel wedge shaped.*

Aleurone —*Mixed yellow and blue with yellow predominating.*

Basal Marking—*Horseshoe depression.*

Rachilla —*Long, covered with short hairs.*

Lateral Veins —*Few.*

Lemma —*Yellow, semi-wrinkled to wrinkled.*

Palea —*Ventral crease, spreading at tip, showing pronounced bridge.*

the plants were quite resistant to stem rust, others were quite susceptible. The agricultural representative in that area, Mr. E. G. Minielly, did much to popularize the variety on the Portage Plains. However, with the advent of Montcalm, it has been disappearing, until now very little is being grown and it is also now becoming badly mixed. This is due to the fact that no registered or certified seed is being produced.

Description. Gartons is a six-rowed, rough-awned variety with blue and white aleurone kernels. It has a moderately weak straw but quite a tough neck and a nodding type of head. As indicated above, it is a mixed variety with some plants showing rust resistance. It has the ability to produce a fair crop when seeded late and on poorly prepared soil.

Adaptation. While some Gartons is still grown in Manitoba, it is not recommended

in any variety zone in the three Prairie Provinces, excepting in Manitoba, where it is third choice as a feed variety in all zones.

It is not equal to O.A.C. 21 for malting purposes but is included among the malting varieties because it is admitted into the No. 3 C.W. Six-row grade.

Peatland

History. Peatland is the progeny of a selection made at the Minnesota Agricultural Experimental Station, St. Paul, Minnesota. It is the result of the co-operative breeding programme between plant breeders at the station and the U.S.D.A. Division of Cereal Crops and Diseases. The selection was made from a bulk lot of barley received in

PEATLAND

Six-row — Rough Awn

SPIKELET

Kernels —*Three, laterals only very slightly twisted.*
Awns —*Barbed, long, often deciduous, tips purple.*
Glume Awns—*Barbed, twice length of glume, tips purple.*
Glumes —*Half length of kernel, covered with short hairs.*

KERNELS

Length —*Midlong.*
Aleurone —*Yellow.*
Basal Marking—*Horseshoe depression.*
Rachilla —*Long, covered with short to medium length hairs.*
Lateral Veins —*Medium to numerous barbs.*
Lemma —*Yellow, sharply defined dorsal vein, wrinkled to smooth.*
Palea —*Moderately wrinkled. Ventral crease somewhat narrow.*

1914 from Switzerland. The introduction is described by Ewert Arberg and G. A. Wiebe as follows: "The seed was presented by Albert Volkart of the Swiss Seed Experiment Station to the American consul, David F. Wilber, and came from Vorrenwald Eich, Canton Lucerne, Switzerland."

The selection was made in 1916. It was tested in Minnesota and found to be suited to the peat lands in the northern part of that state, hence the name Peatland.

It was introduced into Canada about 1930 by Dr. O. S. Aamodt of the University of Alberta, as it was thought it would be suited to the grey wooded soils of northern Alberta. L. R. Hess, of the Canada Malting Company at Calgary, thought it might prove to be a malting variety and encouraged its production.

Description. The bulk lot from which Peatland was selected was described in Switzerland as "an unimproved four-rowed domestic spring barley." Peatland, the selection, is described according to Canadian standards as a six-rowed, rough-awned variety with white aleurone kernels. The straw is stiff and quite resistant to stem rust.

Adaptation. As indicated, it was thought to be suitable for Northern Alberta and was grown more or less extensively for a few years. With the advent of Olli, it is disappearing. It is not recommended in any zone in Western Canada. Its main value now is in the breeding programmes, where it is used for its rust resistant properties.

While Peatland was once admitted to the top malting grades No. 1 C.W. Six-row and No. 2 C.W. Six-row, it was found to be most unsuitable, so was eliminated from these grades about 1940. It, however, was left in the No. 3 C.W. Six-row grade.

MALTING BARLEY VARIETIES FOR EXPORT

The varieties listed under this heading are not acceptable to the Canadian maltsters. They are mostly smooth-awned, white aleurone barleys. Since some of the foreign maltsters prefer white aleurone, stating that the blue varieties are too "hard" for their purpose, malting grades for these barleys were set up by the Board of Grain Commissioners in 1944 to take care of this situation.

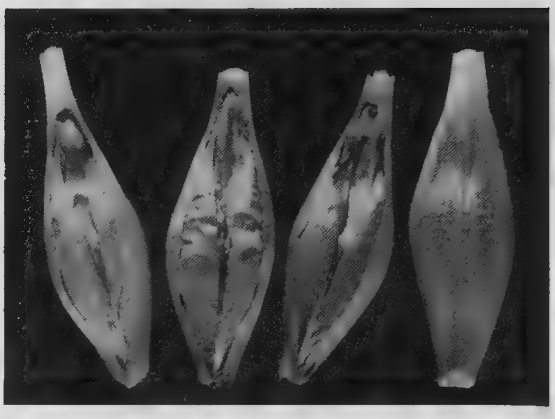
Wisconsin 38

History. Wisconsin 38 or, as it is known in the United States, Wisconsin Barbless, was produced by Professor B. D. Leith at the Agricultural Experiment Station at Madison, Wisconsin. It is the result of a cross between Oderbrucker and Lion made in 1917. Two varieties from this cross were released to the barley growers in that state in 1929. They were then designated Wisconsin Pedigree 38 and Wisconsin Pedigree 37. During the years since their release, Wisconsin 38 became established in Wisconsin to the exclusion of practically all other varieties. It was estimated about 1940 that over 90 per cent of the barley produced in Wisconsin and southern Minnesota was Wisconsin 38. It became the standard of quality of malting barley not only in Wisconsin but in the adjoining states. It was introduced into Manitoba in the 1930 decade. In the early part of the 1940 decade, Wisconsin 38 in the United States was attacked by diseases which reduced the total production by almost 75 per cent, with the result, Manitoba shipped to this market quantities of this variety. As a result, the Board of Grain Commissioners established the yellow grades for malting barley in which Wisconsin 38 was made the standard of quality. The definitions of No. 2 C.W. Yellow and No. 3 C.W. Yellow state they must be composed of "any six-rowed, smooth-awned yellow or white variety equal for malting purposes to Wisconsin 38."

Description. Wisconsin 38 is a six-rowed, smooth-awned variety. It has a moderately stiff straw with a fairly tough neck and a long, lax, nodding head. The kernels have a white aleurone and, in common with other smooth-awned varieties, are easily peeled and broken in threshing. It is quite susceptible to rust, smut, scab, and some of the root rots.

WISCONSIN 38

Six-row — Smooth Awn



SPIKELET

Kernels —*Three, laterals only slightly twisted.*

Awns —*Smooth, long, appressed, rarely deciduous, purple tips.*

Glume Awns—*Rough, equal in length to glumes, tips purple.*

Glumes —*Half length of kernel, without hairs or at most, a few long hairs along the midline.*

KERNELS

Length —*Short to midlong.*

Aleurone —*Yellow.*

Basal Marking—*Horseshoe depression.*

Rachilla —*Short, covered with long hairs.*

Lateral Veins —*Few teeth.*

Lemma —*Yellow, nerves purple, slightly wrinkled.*

Palea —*Slightly wrinkled.*

Adaptation. Wisconsin 38 had a wide distribution in the upper Mississippi Valley. In Canada, it was at one time grown quite extensively in Manitoba. It is not now recommended in any of the variety zones in Western Canada. Where it is grown in Manitoba, it is usually considered to be a feed barley, although, as indicated above, it is admitted into the No. 2 C.W. Yellow and the No. 3 C.W. Yellow grades.

Regal

History. Regal is the progeny of a cross between Manchuria and Lion back-crossed on Manchuria and this back-crossed hybrid again back-crossed on Manchuria. The crossing was done at the Experiment Station at St. Paul, Minnesota, by Dr. H. K. Hayes and his co-workers. Dr. J. B. Harrington, of the University of Saskatchewan, who took some of his graduate work under Dr. Hayes, worked on these hybrids. When he returned to Saskatchewan, he brought with him some of these hybrids. After re-selecting them and testing them under Saskatchewan conditions, he released one of them in 1931 under the name of Regal.

Description. Regal is a six-rowed, smooth-awned, white aleurone variety with a moderately stiff straw. It is a good yielder with considerable vigor and is resistant to stripe disease.

REGAL

Six-row — Smooth Awn

SPIKELET

Kernels	*—Three, with slightly twisted laterals.*
Awns	*—Smooth, long, tips purple.*
Glume Awns	*—Barbed, twice length of glume, tips purple.*
Glumes	*—Half the length of the kernel, without hairs or with a few long hairs restricted to the midline.*

KERNELS

Length	*—Short to midlong.*
Aleurone	*—Yellow.*
Basal Marking	*—Horseshoe depression.*
Rachilla	*—Short, covered with long hairs.*
Lateral Veins	*—Barbs few.*
Lemma	*—Yellow, nerves faintly purple, slightly wrinkled.*
Palea	*—Medium wrinkled, slightly glossy in appearance.*

Adaptation. This variety is grown quite extensively in central Saskatchewan. It is not, however, recommended for any zone in Western Canada, even in Saskatchewan.

It is considered to be equal to Wisconsin 38 in malting quality and is, therefore, admitted to the No. 2 C.W. Yellow and No. 3 C.W. Yellow grades. Much of it is placed in the Feed grades because of the quality due to the area in which it is grown.

Newal

Newal is the result of a cross between Manchuria and Lion crossed with O.A.C. 21. The Manchuria and Lion cross was made at the Experiment Station at St. Paul, Minnesota, by H. K. Hayes and his co-workers. Several hybrids from this cross were sent to the University of Alberta and were tested at that institution. Dr. O. S. Aamodt and Mr. W. H. Johnston crossed one of these hybrids with O.A.C. 21 and selected from this hybrid, Newal. This variety was released to the barley growers in Alberta about 1935. It is grown quite extensively in Alberta.

Description. Newal is a six-rowed, smooth-awned variety with fairly plump white aleurone kernels. The straw is moderately stiff and the neck fairly tough. It is quite susceptible to loose smut and moderately resistant to the other smuts. In malting, it is characterized by its high diastatic power.

Adaptation. Newal seems to be better adapted to the higher altitudes such as are found in Alberta than to the lower altitudes in Manitoba and Saskatchewan. It is recommended for zones 2, 3 and 4 in Alberta but is not recommended for Manitoba or Saskatchewan.

Newal is considered to be equal to Wisconsin 38 in malting quality and is admitted to the No. 2 C.W. Yellow and the No. 3 C.W. Yellow grades. Much of it is grown for feed purposes and is placed in the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

NEWAL

Six-row — Smooth Awn

SPIKELET

Kernels —*Three, laterals quite twisted.*

Awns —*Smooth, long, sometimes tips purple, moderately deciduous.*

Glume Awns—*Barbed, twice length of glume, tips faintly purple.*

Glumes —*Half one-third length of kernel, long hairs confined to wide bands.*

KERNELS

Length —*Midlong.*

Aleurone —*Yellow.*

Basal Marking—*Horseshoe depression.*

Rachilla —*Long, covered with long hairs.*

Lateral Veins —*Barbs medium to numerous.*

Lemma —*Yellow, medium wrinkled, with sharply defined dorsal vein.*

Palea —*Slightly wrinkled and narrow ventral crease.*

Prospect

Prospect is the progeny of a natural cross between Black Barbless and Albert. Black Barbless is a synonym for Lion and is the name by which this variety is known among the farmers in Michigan. Albert, the other parent, was originated at the Central Experimental Farm, Ottawa. Prospect was found by H. J. Kemp at the Dominion Experimental Station, Swift Current, Saskatchewan, in 1924. It was then tested, re-selected and, in 1939, was distributed to the barley growers in south-western Saskatchewan as a feed barley. It gives good yields in this more or less semi-arid area and produces more feed units per acre than any of the other cereal crops.

Description. Prospect is a six-rowed, smooth-awned variety. It has a moderately stiff straw with a tough neck. The heads are more or less erect, depending upon the region and the season. The kernels have a white aleurone.

Adaptation. As indicated above, Prospect was distributed and recommended for the drier areas in Saskatchewan and is still grown quite extensively in this area. However, with the advent of Titan, it is now disappearing in this area. It has never spread in any large amount to the better barley zones.

Prospect is not now recommended for any variety zone in the Prairie Provinces. While it was generally considered to be only a feed barley, it was discovered to have some malting quality and, after thorough testing, was found to be equal to Wisconsin 38 and was admitted to the No. 2 C.W. Yellow and No. 3 C.W. Yellow grades.

PROSPECT

Six-row — Smooth Awn

SPIKELET

Kernels —*Three, with laterals slightly twisted.*

Awns —*Smooth to semi-smooth, long, sometimes deciduous, with purple tips.*

Glume Awns—*Barbed, equal to length of glume, tips purple.*

Glumes —*Half the length of kernel, with long hairs confined to bands, restricted to midline of glume.*

KERNELS

Length —*Midlong and wide through the middle.*

Aleurone —*Yellow.*

Basal Marking—*Incomplete horseshoe.*

Rachilla —*Short, covered with long hairs.*

Lateral Veins —*Few barbs.*

Lemma —*Yellow, slightly to semi-wrinkled.*

Palea —*Smooth, particularly in the ventral crease.*

MILLING VARIETIES

The two-rowed varieties, while used in Canada primarily for the manufacture of pot and pearl barley, are also used in limited quantities for the manufacture of special malts, such as caramel and black malt.

Canadian Thorpe

History. Canadian Thorpe is one of the old-time farmer varieties and little is known definitely of its origin. It is known that in the eighteenth and early part of the nineteenth centuries barley was grown in Canada largely for the malting and brewing industries and, in that period, two-rowed barley was in general use. At that time, two type varieties were commonly grown—Canadian Thorpe and Chevalier. Since barley was introduced into Canada from France and England, it is reasonable to suppose that the Thorpe came from England, where an old-land variety Thorpe or Goldthorpe with a compact head had been grown for some time. With the increase of the six-rowed varieties after the loss of the American market, only very limited quantities of two-rowed barley were grown, with the result that Canadian Thorpe has practically disappeared.

Description. Canadian Thorpe is a two-rowed, rough-awned, white aleurone variety. It has a compact type of head and produces a large, plump, uniform type of kernel.

Adaptation. In the earlier years, considerable Canadian Thorpe was grown in Manitoba. Some growers used to grow small amounts of this variety because it produced an excellent exhibition barley and was awarded prizes at the grain shows. It is not now recommended for any zone in Western Canada.

It is still used as the standard of quality in the top two-rowed grades — No. 1 C.W. Two-row and No. 2 C.W. Two-row. The grade definitions for these grades state, "shall be composed of any two-rowed variety equal for pearling or malting purposes to Canadian Thorpe."

CANADIAN THORPE

Two-row — Rough Awn
Compact Head

SPIKELET

Kernels —*One, two empty glumes.*
Awns —*Barbed, long, quite deciduous.*
Glume Awns—*Rough, half length of glume.*
Glumes —*About half length of the kernel, covered with long hairs.*

KERNELS

Length —*Midlong, wide in proportion to length.*
Aleurone —*Yellow.*
Basal Marking—*Traverse crease.*
Lateral Veins —*Free from barbs.*
Lemma —*Yellow, slightly wrinkled.*
Palea —*Slightly wrinkled, with narrow, shallow ventral crease.*

Hannchen

History. Hannchen is a plant selection made from Hanna at the plant breeding station at Svalof, Sweden. Hanna is the two-rowed malting barley grown most extensively in Central Europe. The highly prized Moravian barley produced in Czechoslovakia is composed largely of this variety. It is from this variety that the Swedes selected Hannchen or "little Hanna." Hannchen was introduced into the United States by the U.S.D.A. about 1904 and was distributed in that country about 1908. About this time, it was introduced into Canada and was grown in an area north of Winnipeg, Manitoba.

It was found to be well suited for the manufacture of pot and pearl barley. It was then introduced into the central-eastern section of Saskatchewan, where most of the supply of this barley is now grown. Most of this variety produced in Canada traces back to a selection made at Saskatoon, Sask., by Dr. Manley Champlin.

Description. Hannchen is a two-rowed, rough-awned variety producing medium plump, white aleurone, shallow creased kernels. The head is lax and nodding. It has a medium stiff straw and is considered to be moderately resistant to stripe disease.

Adaptation. Hannchen is recommended for zones 3D and 3F in Saskatchewan and can be grown in Manitoba. It is equal to Canadian Thorpe in malting and milling quality and is graded into No. 1 C.W. Two-row and No. 2 C.W. Two-row.

HANNCHEN

Two-row — Rough Awn

SPIKELET

Kernels —*One, with two empty glumes.*
Awns —*Barbed, long, tips purple, sometimes deciduous.*
Glume Awns—*Rough, equal in length to glume, tips purple.*
Glumes —*Half to three-quarters length of kernel, covered with long hairs.*

KERNELS

Length —*Midlong to long.*
Aleurone —*Yellow.*
Basal Marking—*Horseshoe depression.*
Rachilla —*Long, covered with long hairs.*
Lateral Veins —*Free from barbs.*
Lemma —*Yellow, decidedly wrinkled.*
Palea —*Wrinkled, with narrow ventral crease.*

Charlottetown 80

History. Charlottetown 80 is a selection made at the Dominion Experimental Station in Prince Edward Island by the Superintendent, Dr. J. A. Clark. Old Island Two-rowed is an old farmer variety that came originally from England, and was probably an admixture of both Thorpe and Chevalier types. Clark selected one of the Chevalier types which had a tendency to drop its awns at maturity. It was distributed in Prince Edward Island, where it is grown quite generally and has spread into Nova Scotia and New Brunswick.

CHARLOTTETOWN 80

Two-row — Rough Awn
Lax, Nodding Head

SPIKELET

Kernels	*—One, with two empty glumes.*
Awns	*—Barbed, long, tips purple, deciduous.*
Glume Awns	*—Rough, equal in length to glume, tips purple.*
Glumes	*—Half length of kernel covered with short hairs.*

KERNELS

Length	*—Midlong and plump.*
Aleurone	*—Yellow.*
Basal Marking	*—Horseshoe depression.*
Rachilla	*—Long, covered with short hairs.*
Lateral Veins	*—Few very fine barbs.*
Lemma	*—Yellow, smooth.*
Palea	*—Wrinkled, with narrow, medium shallow ventral crease.*

Description. Charlottetown 80 is a two-rowed, rough-awned variety with a Chevalier or nodding type of head. The straw is moderately stiff. The kernels are large, plump and have a white aleurone.

Adaptation. As indicated above, this variety is quite popular in the Maritimes. It has been grown in limited quantities in Western Canada but has not displaced Hannchen. It is, therefore, not recommended in any of the three Prairie Provinces.

Charlottetown 80 is quite satisfactory for the manufacture of special malt, and pot and pearl barley. It is, therefore, admitted into the No. 1 C.W. Two-row and the No. 2 C.W. Two-row grades.

FEED VARIETIES

As indicated previously, any variety of barley can be used for feed. In fact, in some of the variety zones in Manitoba and Saskatchewan, Montcalm, an approved malting variety, is recommended as a feed barley. The so-called feed varieties are those that are unsuitable for malting or milling.

Plush

History. Plush is a hybrid variety originated at the Dominion Experimental Farm at Brandon, Manitoba. It is the progeny of a cross made by S. J. Sigfusson between Lion and Bearer. Lion is a black, smooth-awned variety introduced into the United

PLUSH

Six-row — Smooth Awn

SPIKELET

Kernels —*Three, laterals decidedly twisted.*

Awns —*Smooth, long, tips purple, rarely deciduous.*

Glume Awns—*Rough, equal in length to glume, tips purple.*

Glumes —*Half length of kernel, with long hairs confined to bands.*

KERNELS

Length —*Short to midlong.*

Aleurone —*Yellow.*

Basal Marking—*Incomplete horseshoe.*

Rachilla —*Short, covered with long hairs.*

Lateral Veins —*Barbs few.*

Lemma —*Yellow, nerves purple, brittle, peels easily, slightly wrinkled.*

Palea —*Grayish yellow, rough in ventral crease, semi-wrinkled.*

States from Russia. The other parent, Bearer, is of hybrid origin, its parents being Blue Long Head and Gordon. This cross was made at the Central Experimental Farm at Ottawa in 1903. Gordon was also a Central Experimental Farm hybrid, the result of a cross between Baxter's Six-row, and Duckbill, a two-rowed variety of the Thorpe type.

Plush was selected and released to the barley growers in Manitoba in 1938 by W. H. Johnston, who was Sigfusson's successor.

Description. Plush is a six-rowed, smooth-awned variety producing white aleurone kernels. The straw is moderately stiff, with quite a tough neck. The heads are long and nodding. Like most smooth-awned sorts, the kernels peel badly in threshing.

Adaptation. Plush has been grown quite extensively in Manitoba and eastern Saskatchewan. It is recommended as a feed barley in zones 2A and 7 in Manitoba, and zones 2B, 2E, 3B, 3C ,3E and 3J in Saskatchewan. It is not recommended in Alberta.

It cannot be graded into the malting or milling grades, therefore it is only admitted into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

Vantage

History. Vantage is a sister sort to Plush. It was developed and distributed by Mr. W. H. Johnston at the Dominion Experimental Farm, Brandon, Manitoba. Mr. Johnston released it to the barley growers in Manitoba and eastern Saskatchewan in 1948. It is stem rust resistant and, in favourable seasons, will outyield Plush. It was thought it would displace Plush and other feed barleys but, under field conditions, it proved to be very susceptible to leaf blotch and was quite disappointing in yield.

Description. Vantage is a six-rowed, smooth-awned variety with white aleurone kernels. It has a stiffer straw and tougher neck than Plush. It is more resistant to shattering. In disease reactions, it is resistant to stem rust but is susceptible to leaf rust and to loose and covered smut, and is very susceptible to leaf blotch.

Adaptation. It is grown to a limited extent in western Manitoba and eastern Saskatchewan. It is recommended as a feed barley in zones 1, 2B, 2C, 3, 4A, 4B, 5 and 6 in Manitoba, and in 2A, 2B, 3A, 3B, 3C, 3D, 3F and 4A in Saskatchewan. It is not recommended in Alberta.

Since Vantage is only a feed barley, it can be graded only into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

Titan

History. Titan originated at the University of Alberta, Edmonton. It is difficult to give credit to any one person for its development because a great number of workers in the Plant Science Department have assisted. It was finally released to the barley growers in the straight combining areas of Alberta in 1943, under the direction of Dr. A. G. McCalla and his co-workers.

Titan is the result of a cross between Trebi and Glabron.

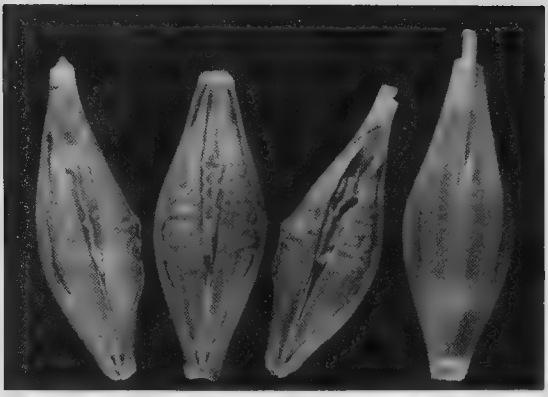
Description. Titan is a six-rowed, smooth-awned variety. It has a short, stiff straw with upright heads. The kernels have a white aleurone. It will not shatter readily and is, therefore, well adapted as a straight combine barley. The greatest objection to this variety is that the awns are very persistent, which makes it difficult to thresh.

Titan is susceptible to the rusts but resistant to both loose and covered smut.

Adaptation. Titan is grown in the drier areas in Alberta and Saskatchewan. The Alberta Varietal Committee states, "It gives high yields on the black soils in the south-centre but does not yield so well in the grey soil areas."

TITAN

Six-row — Smooth Awn



SPIKELET

Kernels	*—Three, laterals slightly twisted.*
Awns	*—Smooth, long, tips purple.*
Glume Awns	*—Rough, twice the length of the glume, tips purple.*
Glumes	*—Half length of kernel, without hairs or, at most, a few long hairs on the midline.*

KERNELS

Length	*—Short.*
Aleurone	*—Grayish yellow.*
Basal Marking	*—Horseshoe depression.*
Rachilla	*—Short, covered with hairs of variable length.*
Lateral Veins	*—Barbs few.*
Lemma	*—Grayish yellow, semi-wrinkled.*
Palea	*—Decidedly wrinkled, particularly in the ventral crease.*

Titan is recommended as a feed barley in zones 2A and 7 in Manitoba, zones 1A, 1B, 1C, 2A, 2B and 2C in Saskatchewan, and in zones 1, 2 and 3 in Alberta. It is also recommended in the irrigated areas in this province.

Since Titan is only a feed barley, it can be graded only into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

Trebi

History. Trebi is the progency of a plant selection from a bulk lot of barley obtained from the south shore of the Black Sea in Asiatic Turkey. This commercial lot was taken to United States by Frank Benton of the Bureau of Entomology through the Office of Foreign Seed and Plant Introduction. This organization obtained it from Dem. Ch. Papathopoulos, of Samsoun, Asiatic Turkey. The seed from which this grain was produced came from Trebizone, Asiatic Turkey, hence the name Trebi.

It is interesting to note that, in its native area, it was said to be of high quality and the grain was exported for the manufacture of beer. If that is so, the selection Trebi did not retain this property, for it is found to be useless for malting in Canada and the United States.

The selection was made by H. V. Harlan of the Division of Cereal Crops and Diseases of the U.S.D.A. at the Minnesota Agricultural Experiment Station and was sent to Aberdeen, Idaho, where it was tested for a number of years and released to the growers in 1918. From this distribution, it was taken into Alberta and from there spread eastward over Western Canada. For a while it was very popular but in later years has been replaced by such varieties as Montcalm, etc.

Description. Trebi is a six-rowed, rough-awned variety of the Mediterranean or Coast type of barley. It has quite a stiff straw and very tough neck. It has blue

aleurone kernels, which are large and coarse in appearance. It is resistant to loose smut but susceptible to most other diseases.

Adaptation. Trebi seemed to have a very wide adaptation. In the period of its popularity, it was grown in practically all sections of Western Canada: the dry areas, the moist areas, the irrigated areas and, in the north and in the south.

At present, it is only recommended in the irrigated areas in Alberta. It is now recognized as only a feed barley. At one time, it was thought by T. J. Harrison that it

TREBI

Six-row — Rough Awn

SPIKELET

Kernels —Three, laterals slightly twisted.
Awns —Barbed, long, tips purple.
Glume Awns—Rough, twice the length of the glume, tips purple.
Glumes —Half to three-quarters length of kernel, covered with short hairs.

KERNELS

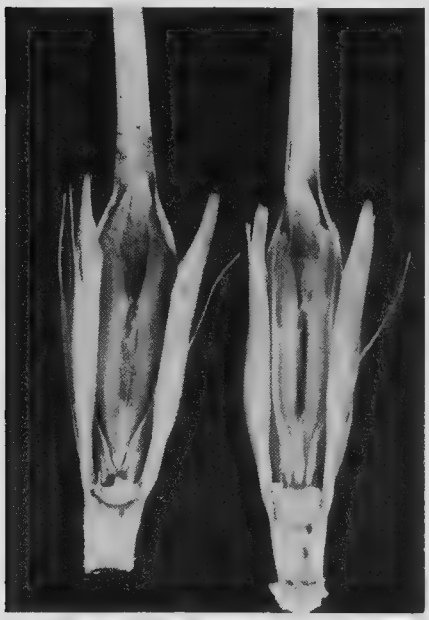
Length —Long.
Aleurone —Blue.
Basal Marking—Incomplete horseshoe.
Rachilla —Long, covered with short hairs.
Lateral Veins —Very few barbs.
Lemma —Grayish yellow, nerves purple, slightly wrinkled, thick and coarse.
Palea —Semi-wrinkled, where lemma overlap large wrinkles, giving coarse or rough appearance.

would compete with the Coast barleys in the British malting trade. Trebi grades were set up but it proved to be an abortive effort, for it was useless for malting and the grades had to be repealed. At present it is only admitted into the feed grades of No. 1 Feed, No. 2 Feed and No. 3 Feed.

Sanalta

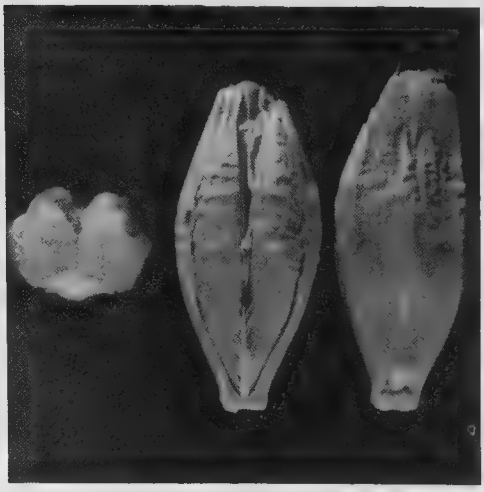
History. Sanalta was originated at the University of Alberta. It was the result of a cross between Smooth Awn and Duckbill. Smooth Awn is a six-rowed, smooth-awned variety brought to Canada from the United States for plant breeding purposes. Duckbill is a farmer variety of the Thorpe type, being two-rowed and rough-awned, grown in the earlier years in Canada. After developing Sanalta, the University of

Alberta sent it out to the Canadian Experimental Stations for testing. The two-rowed sorts were never very popular in Western Canada, so it did not find favour. G. E. DeLong, of the Dominion Experimental Station at Lacombe, Alberta, was quite impressed with it and released it to the barley growers in central Alberta. However, as this was a malting barley area and Sanalta was not a malting barley, it did not spread to any great extent. A Manitoba elevator operator, John Shanks, saw this variety and was impressed by it and brought it to Pettapiece, north of Brandon, Manitoba. From there, it spread out to other districts in the province, where it is now quite largely grown.



SANALTA

Two-row — Smooth Awn



SPIKELET

Kernels —*One, with two empty glumes.*
Awns —*Smooth, long, tips purple.*
Glume Awns—*Rough, equal in length to glume, tips purple.*
Glumes —*Half length of kernel, covered with long hairs, sometimes confined to bands.*

KERNELS

Length —*Midlong.*
Aleurone —*Yellow.*
Basal Marking—*Traverse crease.*
Rachilla —*Medium long, covered with long hairs.*
Lateral Veins —*Free from barbs.*
Lemma —*Yellow, wrinkled.*
Palea —*Wrinkled, with narrow, deep ventral crease.*

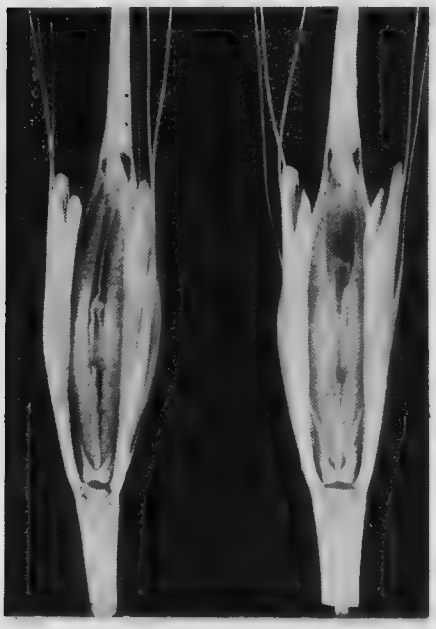
Description. Sanalta is a two-rowed, smooth-awned variety. It has the nodding type of head somewhat like the Chevalier. The straw is moderately stiff and the neck tough. The kernels are white and plump but have a very deep crease.

Adaptation. Sanalta is grown around Lacombe in Alberta and in the west-central section of Manitoba around Rapid City. It is recommended as a feed barley in zones 1, 2A, 2B, 2C, 3, 4A, 4B, 5, 6 and 7 in Manitoba. It is not recommended in either Saskatchewan or Alberta.

While it has a large, plump, white kernel, it is not suited for milling because of the deep crease, which causes too much waste in pearling it out. It is, therefore, only a feed barley grading into No. 1 Feed, No. 2 Feed and No. 3 Feed.

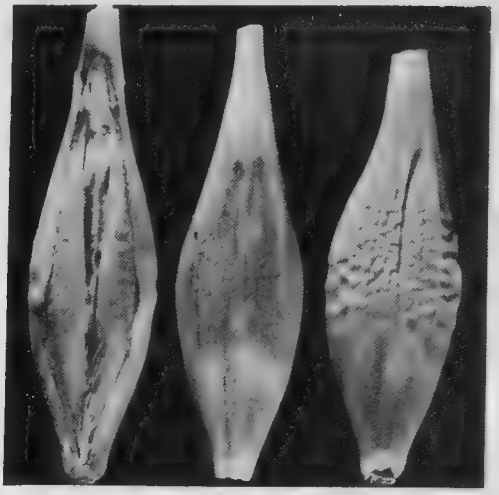
Rex

History. Rex is a hybrid variety originated at the University of Saskatchewan, Saskatoon. Dr. J. B. Harrington, of the Field Husbandry Department, crossed Velvet and Hannchen to produce Rex. Velvet is a six-rowed, smooth-awned hybrid produced at the Minnesota Agricultural Experiment Station by Harlan and Hayes from a cross between Manchuria and Lion crossed with Luth. Hannchen is a two-rowed, rough-awned variety originated in Sweden. Rex was released to the barley growers in Saskatchewan in 1939 and is grown in a limited acreage in that province.



REX

Two-row — Smooth Awn



SPIKELET

Kernels —*One, with two sterile flowerettes.*
Awns —*Smooth, long, with purple tips, rarely deciduous.*
Glume Awns—*Rough, one and a half to twice as long as the glume, tips purple.*
Glumes —*Half the length of the kernel.*

KERNELS

Length —*Midlong.*
Aleurone —*Yellow.*
Basal Marking—*Horseshoe depression.*
Rachilla —*Long, covered with long hairs.*
Lateral Veins —*Free from barbs.*
Lemma —*Yellow, nerves purple, wrinkled.*
Palea —*Slightly wrinkled with deep ventral crease.*

Description. Rex is a two-rowed, smooth-awned variety. It has a stiff straw with a long, lax head of the nodding type. It produces a large, medium plump, white aleurone kernel.

Adaptation. Rex is grown on scattered farms throughout Saskatchewan but mostly in the central and south-central regions. It is not recommended in any zone in the three Prairie Provinces. While it is a two-rowed barley, it is unsuitable for both malting and milling and is, therefore, used only for feeding. It is admitted to the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

Compana

History. Compana is a selection from a composite cross made by H. V. Harlan at the Aberdeen substation at Aberdeen, Idaho. The composite cross was developed by the Division of Cereal Crops and Diseases in co-operation with the Idaho Agricultural Experiment Station. The hybrid Compana was tested at several of the Inter-Mountain Experiment Stations. It was released by the Montana Agricultural Experiment Station in 1941. It was thought it would displace Horn in the non-irrigated lands in that state.

Seed of Compana infiltrated across the International Boundary into Alberta. When it became fairly well established in the southern part of this province, the Dominion Experimental Station at Lethbridge, having had it under test for some years, applied to have it licensed. The license was granted in 1949.

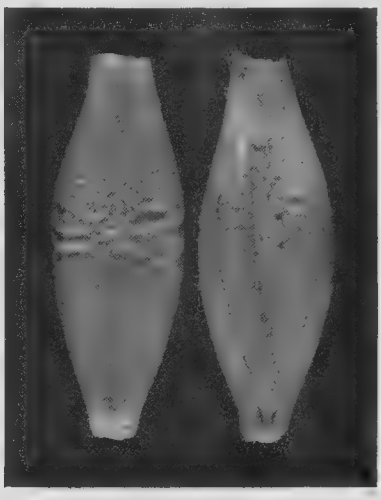
Description. Compana is a two-rowed, semi-smooth-awned variety. It has a weak straw, a fairly lax type of head. It is drought resistant, producing a fairly plump kernel with a white aleurone. It is also stated to be resistant to grasshopper attacks.

Adaptation. It would appear that Compana is grown fairly extensively in the dryland areas in Montana and is becoming quite popular under the same conditions in Alberta. It is recommended for the dryland area in zone 1 in Alberta. It is not recommended anywhere in either Manitoba or Saskatchewan.

While Compana is a two-rowed, white aleurone barley, it is not suitable for either malting or milling. It is, therefore, graded only into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

COMPANA

Two-row — Semi-smooth Awn
Lax Head



SPIKELET

Kernels —*One, with two empty glumes.*
Awns —*Semi-smooth, long, tips sometimes may be faintly purple.*
Glume Awns—*Rough, equal in length to glume, tips may be faintly purple.*
Glumes —*Half length of kernel with long hairs in bands or covering whole glume.*

KERNELS

Length —*Midlong to long, wide at germ end.*
Aleurone —*Yellow.*
Basal Marking—*Incomplete horseshoe.*
Rachilla —*Short, covered with long hairs.*
Lateral Veins —*Free from barbs.*
Lemma —*Yellow, semi-wrinkled to wrinkled.*
Palea —*Wrinkled, with wide, deep ventral crease.*

Six-row, Hooded Barley

SPIKE OR HEAD OF WARRIOR

Typical of most hooded barleys grown in Western Canada.

In some hooded barley, the hood is borne on a longer stem.

Hulless Barley

There are several varieties of hulless barley in both the two- and six-row types. They may also be awned or hooded. They are grown to a very limited extent in Western Canada. The most common varieties are Black Hulless, White Hulless, Guy Mayle, Nepal, and Himalaya. They are easily identified, being hulless and of quite distinct aleurone color; for example, Nepal is yellow, Himalaya is blue, Black Hulless is a dark purple, White Hulless is white.

Hulless barley is used for feed. In small quantities, it is mixed off in the feed grades, when delivered to the elevators. Since the yield per acre is less than other types, it is not grown commercially.

TYPICAL HULLESS BARLEY

COLSESS

Six-row — Hooded

SPIKELET

Kernels —*Three, laterals showing little or no twisting.*

Hoods —*Sessile, slightly elevated, without appendage on middle lobe or, at most, a very short one.*

Glume Awns—*Rough, less than half in length of glume, tips faintly purple.*

Glumes —*Half length of kernel, covered with short hairs.*

KERNELS

Length —*Midlong to long.*

Aleurone —*Blue gray.*

Basal Marking—*Incomplete horseshoe.*

Rachilla —*Long, covered with short hairs.*

Lateral Veins —*Barbs numerous.*

Lemma —*Yellow, nerves purple, wrinkled.*

Palea —*Decidedly wrinkled.*

Colsess

History. Colsess is a hybrid variety resulting from a cross between Coast and Success. Coast, or to be more correct, "California" Coast, a six-rowed, rough-awned variety, was introduced into California by the early Spanish settlers in the eighteenth century. It probably came from north Africa and is of the Mediterranean type. Success is an awnless or hooded variety and is probably the result of a cross between Nepal, a hooded, naked barley from India, and some eastern American variety.

Colsess was originated by D. W. Frear of the Colorado Agricultural Experiment Station, Fort Collins, Colorado, in 1911. It was released in 1925. It was introduced into Saskatchewan by Dr. Manley Chaplin and Dr. J. B. Harrington as a barley for wild oat control.

Description. Colsess is a six-rowed, hooded variety. The straw is stiff and the head erect. The kernels are long and lean, with a blue aleurone. It is a very early maturing barley and will ripen and be harvested before the wild oats mature and shatter.

Adaptation. Colsess is grown in a limited acreage in Saskatchewan. Since Warrior has been introduced, it is replacing Colsess.

Colsess is not recommended in any one of the three western Provinces. it is useless for either malting or milling, so it can be used only as a feed barley and is, therefore, graded into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

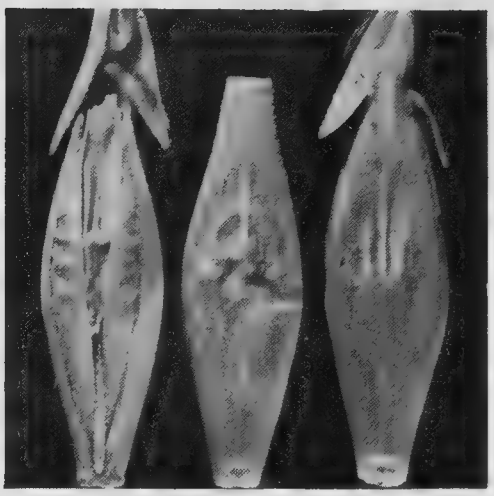
Warrior

History. Warrior is a hybrid variety originated at the University of Saskatchewan, Saskatoon. It is the result of a cross between Trebi and Colsess. The cross was made by Dr. J. B. Harrington in 1930 and was distributed in 1943. It is grown only in Saskatchewan for feed and wild oat control.

Description. Warrior is a six-rowed, hooded variety with a stiff, medium length straw and tough neck, and is quite suitable for straight combining. The heads are

WARRIOR

Six-row — Hooded



SPIKELET

Kernels	*—Three, laterals not twisted.*
Hoods	*—Sessile, with no appendage on middle lobe, or at most a very short one.*
Glume Awns	*—Rough, twice the length of the glume, occasionally transformed into hoods.*
Glumes	*—Half to three-quarters length of the kernel, covered with short hairs.*

KERNELS

Length	*—Long.*
Aleurone	*—Grayish yellow.*
Basal Marking	*—Incomplete horseshoe.*
Rachilla	*—Long, covered with short hairs.*
Lateral Veins	*—Numerous barbs.*
Lemma	*—Yellow, with deep depression along mid rib.*
Palea	*—Wrinkled, with fairly smooth ventral crease.*

erect. The kernels are long and thick, and have a blue aleurone. It is stated to be resistant to stripe disease, moderately resistant to covered smut and is resistant to loose smut.

Adaptation. While the acreage of Warrior is small, it is increasing and will eventually displace most of the other beardless or awnless varieties. It is recommended in Saskatchewan as a green feed variety and for the control of wild oats. It is not recommended in either Manitoba or Alberta. Since it is only a feed variety, it can be graded only into the No. 1 Feed, No. 2 Feed and No. 3 Feed grades.

Velvon 11

History. Velvon 11 is the composite of 14 selections made from Velvon. The original Velvon is the progeny of a cross between Trebi and Colorado 3063. The latter originated from a cross between Coast and Lion. Both Velvon and Velvon 11 were produced by Dr. R. W. Woodward in a co-operative project between the Utah Agricultural Experiment Station and the United States Department of Agriculture at Logan, Utah. Velvon 11 was released in 1943 and was introduced into Canada shortly after. It was tested in regular barley tests at the Universities and Experimental Stations. At the Experimental Station at Scott, Saskatchewan, it gave rather good results. In 1949, A. G. Kusch, of the Scott Station, applied for and succeeded in having Velvon 11 licensed for sale as seed in Canada.

Description. Velvon 11 is a six-rowed, smooth-awned variety. It is early ripening, has a weak straw, is resistant to many forms of both covered and loose smut.

Adaptation. According to the tests conducted at Scott, this variety is quite suited to the region in the north-west area in Saskatchewan. So far it does not seem to be adapted to any other area in Western Canada.

SPIKELETS

Kernels —*Three, laterals slightly twisted.*
Awns —*Smooth, long, tips purple.*
Glume Awns—*Rough, equal to or twice length of glume, tips purple.*
Glumes —*Half the length of the kernel, with short hairs on the midline and occasionally without hairs.*

KERNELS

Length —*Midlong to long.*
Aleurone —*Yellow.*
Basal Marking—*Traverse crease.*
Rachilla —*Long, covered with short hairs.*
Lateral Veins —*Smooth.*
Lemma —*Yellow, nerves purple, very slightly wrinkled.*
Palea —*Slightly wrinkled with quite a wide ventral crease.*

AMERICAN VARIETIES

There are several varieties of barley that have been developed in the United States and are grown along the border just south of the Prairie Provinces. Some of these varieties are not licensed by the Dominion Department of Agriculture and cannot be sold in Canada under the variety name; however, some seed does infiltrate across the boundary and is frequently grown, commercially, in quite substantial quantities. In order that the growers may identify these, a short description of two of the most important is appended.

Kindred

History. Kindred or L. Barley is the progeny of a plant selection made in a field of commercial barley. In 1937 a farmer by the name of S. T. Lykken, at Kindred, North Dakota, had a commercial field of Wisconsin Pedigree 37. It was very badly rusted but he discovered one plant that stood out with apparently no rust. Lykken saved the seed of this plant, increased it and had it tested at the North Dakota Agricultural Experiment Station. It continued to be rust resistant and was found to be satisfactory for malting under American conditions. It was distributed in 1942 to the barley growers in North Dakota. It was known locally as L. Barley from the name of the originator, Lykken. As it was distributed more widely, it became known as Kindred, after the name of the town or district where it was originated.

KINDRED

Six-row — Rough Awn

SPIKELET

Kernels —Three, laterals very slightly twisted.
Awns —Barbed, long, tips purple, rarely deciduous.
Glume Awns—Rough, twice the length of the kernel, tips purple.
Glumes —Half length of the kernel, covered with short hairs.

KERNELS

Length —Midlong.
Aleurone —Yellow.
Basal Marking—Horseshoe depression.
Rachilla —Long, covered with short to long hairs.
Lateral Veins —Numerous teeth.
Lemma —Yellow, slightly wrinkled.
Palea —Very slightly wrinkled, deep ventral crease.

Description. Kindred is a six-rowed, rough-awned variety with a weak straw and a nodding type of head. The kernels are mid-long, rather lean, and have a white aleurone. It is quite different from Wisconsin Pedigree 37, from which it was selected. In Canada, it resembles somewhat closely the Gartons variety. Its outstanding agronomic property is its resistance to stem rust.

Adaptation. It is grown quite generally in North Dakota as a malting barley and, to a limited extent, in Minnesota. It is not licensed for sale in Canada; however, a small amount has infiltrated across the International boundary and is being grown in Manitoba.

In Canada, it is not considered to be a top malting barley and when it comes to market will be graded only into the No. 3 C.W. Six-row or the Feed grades.

Moore

History. Moore is a hybrid variety originated by Dr. R. G. Shands at the Wisconsin Agricultural Experiment Station at Madison, Wisconsin. It is the result of a cross between Wisconsin 38 and Chevron back-crossed with Wisconsin 38 crossed with Olli. The hybrid was named Moore after Professor R. A. Moore, the pioneer in barley improvement in Wisconsin and a collaborator with the late Dr. C. A. Zavitz from

MOORE

Six-row — Smooth Awn

SPIKELET

Kernels —*Three, laterals slightly twisted.*
Awns —*Smooth, long, rarely deciduous.*
Glume Awns—*Rough, twice length of glume.*
Glumes —*Half length of kernel, partly covered with long hairs, particularly along the midline.*

KERNELS

Length —*Midlong.*
Aleurone —*Yellow.*
Basal Marking—*Horseshoe depression.*
Rachilla —*Short, covered with long hairs.*
Lateral Veins —*Numerous barbs.*
Lemma —*Yellow, wrinkled.*
Palea —*Wrinkled and a deep ventral crease.*

Ontario. The Moore variety was released to the barley growers in Wisconsin in 1949. While it was not licensed for sale in Canada, American seedsmen had some 25,000 bushels of certified Moore seed produced under control in Manitoba. This had to be all shipped back to the American seedsmen.

Description. Moore is a six-rowed, smooth-awned variety. To the average barley grower in Canada, it looks somewhat like Montcalm. The straw is moderately stiff, the neck tough and the heads a little more erect. The kernels are plump for six-row and have a white aleurone. It is resistant to stem rust, spot blotch, powdery mildew and root rot. It is susceptible to loose smut, covered smut, scab, stripe disease and leaf rust.

Adaptation. Dr. Shands, the originator of Moore, states, "It now seems that Moore will be best adapted to Wisconsin, northern Illinois, northern Iowa and central and southern Minnesota. It seems likely that Moore will also be adapted to limited areas in the Dakotas, particularly areas with higher rainfall in the eastern part of these states."

According to malting tests made at Madison, Wisconsin, Moore should be quite suited for malting according to American standards. It may not be satisfactory to Canadian maltsters. More tests are required to determine if it is equal to O.A.C. 21.

Since it is not licensed, seed of Moore cannot be imported and sold in Canada.

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